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Ecuador's Agriculture and the War

by **KATHRYN H. WYLIE***

Agriculture, including forestry, is now and has been since colonial days, the principal industry and source of livelihood in Ecuador. The western lowlands produce crops for the export market, and the Sierra or highland region produces largely for the domestic market. Differences in the climate and soil composition of these two areas are reflected in the diverse character of their agriculture. World War II brought expansion in production of strategic commodities for export, high prices, food shortages, and labor dislocations; it has left confusion with respect to the future of the commodities whose production it stimulated. For the long pull, however, the principal problems of Ecuadoran agriculture remain those of prewar days—lack of technical knowledge and improved agricultural methods, inadequate transportation facilities, poor health and sanitation conditions, and, as a consequence of the foregoing, the need for higher levels of living.

Physical Characteristics

GEOGRAPHY

The Republic of Ecuador lies across the Equator on the northwestern coast of South America between Colombia and Peru. Its approximate area is 97,000 square miles,[1] or about the same as that of the State of Oregon. In addition to its continental area, the country owns the Galapagos Islands, a group of 13 large and several small islands, lying about 550 miles off the coast. Ecuador is one of the Andean countries, two ranges of this lofty system traversing the entire length of the country from north to south to divide it into three distinct regions. (See fig. 1.)

To the east of the mountains is the *Oriente* or eastern lowlands, draining into the mighty Amazon River. The two Andean ranges form the boundary of a tableland varying in width from 20 to 40 miles. A series of cross ridges breaks the mountain valley into 10 basins, each with its own river system, some draining toward the Amazon to the east and others toward the Pacific Ocean.

West of the Andes is the coastal plain, a potentially rich agricultural region, which is itself separated by a low divide into the Pacific littoral and an interior valley. The northern section of the valley is drained northwestward into the ocean by the Esmeraldas River, whose tributaries extend to the highlands around Quito. The Guayas River system, which drains to the southwest through a great part of this interior valley, forms the largest drainage basin on the west coast of the continent.

CLIMATE AND RAINFALL

As in most equatorial countries, temperature varies with elevation and cloudiness but along the coastal regions is tempered by the effects of the Humboldt Current. In general, the western lowlands are hot; the average annual temperature at Guayaquil is 77.5° F., varying from a maximum of 93° to a minimum of 67°. The highlands are cool, the average annual temperature at Quito being 55.2°, ranging from a maximum of 80° to a minimum of 38° F., with wide variations in diurnal temperatures. The high paramos, between 11,000 and 15,000 feet in altitude, are cold and wind-swept, whereas the Oriente east of the mountains is hot and humid.

FIGURE 1.—Map showing principal areas of production.

*Office of Foreign Agricultural Relations.

[1] Subject to revision.

Ecuador's widest range of climate is west of the Andes. Rainfall and humidity are high in the northern portion of the coast. The Salinas Peninsula, west of Guayaquil, is desert, with practically no rainfall; Machala, in the extreme southwest, and the central coast, north of Salinas, have low rainfall and arid climates. In the Guayas Valley and elsewhere in the central portion of the coastal region, the rainfall is moderate, with a long dry season. The dry-season temperatures, however, are moderated by long periods of cloudiness.

Except where the moist winds from east and west break through mountain passes, the Andean valleys, lying between the two rows of peaks, have a moderate to low rainfall, moderate humidity, and considerable cloudiness.

SOILS [2]

Wide variations in parent materials, rainfall regime, cloudiness, altitude, and slope have brought about the development of a wide range of soils. In the northern half of the Andes the surface materials are almost entirely fragmental volcanic materials (sand and ash). The grayish-brown soils are often sandy, droughty, and erosive, though well supplied with most plant nutrients. Irrigation is often necessary for satisfactory crop growth. In some soil types hardpans are important. Barley, wheat, rye, corn, and eucalyptus trees for fuel and lumber are important crops.

In various of the mountain passes, near the timber line, the paramo soils developed from volcanic ash are often very deep and dark-colored. Here the climate is cool and often cloudy; important crops are potatoes, barley and other grains, quinoa, etc.

On the outer slopes of the Andes there is a much heavier rainfall. On the usually steep to very steep slopes brown, shallow, stony soils are common. These soils are mostly forested; citrus, corn, sugarcane, and Castilla rubber are grown in places. In the southern interior valleys of the Andes the soils are brownish to reddish, clayey, and less productive than the volcanic soils in the northern half of the Ecuadoran Andes. Here, also, irrigation is necessary for satisfactory crop production.

Except for very narrow bits of terraces and narrow ribbons of recent alluvial soils along some of the rivers, the soils in the Amazonas are predominantly clays to silty clay loams. Where they lie undisturbed under forest, the structure is good; but cultivation is usually difficult, and yields are only moderate under the prevailing high rainfall.

Because of the prevailing winds, almost all the volcanic ash from the volcanoes of central Ecuador is blown westward; therefore most of it cannot fall where it would rejuvenate the leached soils of the Amazonas. Close to some of the recently active volcanoes in the western Amazonas, however, there has been some soil improvement by volcanic ash falls.

Soils of coastal Ecuador vary widely. In the Salinas region, west of Guayaquil, there are saline desert soils. In the Machala region, extreme southwest Ecuador, and near Guayaquil the soils are heavy black clays; whereas along the rivers through these clay valleys are narrow strips of brown silt loam and fine sandy loam. The clays are used for pasture or for rice, and the narrow strips of stream-bank soils are planted to cacao and some fruits. In the coastal Manta-Bahía region there are shallow light-brown, often stony, soils on the hills. Farther north, in the Esmeraldas region an important soil on the hills is a reddish-brown clay loam. In those parts of the coastal region and foothills of the Andes, particularly in the Santo Domingo and Quevedo (Pichilingue) regions, where volcanic ash buried the older, reddish-brown clay loams, and then weathered somewhat, an unusually excellent soil is now found. Cacao, coffee, bananas, upland rice, and corn are grown. In the Babahoyo, Bucay, and other regions farther south, where soils have developed on large flattish outwash fans from the Andes, without being affected by recent volcanic ash falls, the soils, while good, are not of such high quality. They are often very stony or gravelly, close under the surface. Here sugarcane, bananas, and rice are common crops.

Economic Characteristics

PEOPLE AND LABOR SUPPLY

Ecuador has never had a population census. About two-thirds of the estimated population of 3,000,000 are concentrated in the Sierra, and about one-third, west of the Andes, largely in the Guayas Valley. The Oriente is very sparsely settled. About two-thirds of the people are rural. The racial composition is estimated at 10 percent white,

[2] Credit is due Dr. Robert L. Pendleton for this section on soils.

39 percent Indian, 41 percent mestizo, 5 percent Negro and mulatto, and 5 percent other.

Guayaquil, the largest city, with an estimated 154,000 inhabitants, is located at the mouth of the Guayas River and is the port of shipment for most of Ecuador's exports. Quito, the capital, is in the highlands at an altitude of 9,300 feet. Other highland cities south of Quito are Latacunga, Ambato, and Riobamba. Cuenca, capital of Azuay Province in the south, Loja in the far south, and Ibarra in the north are other important cities.

Low wages and rather primitive living conditions are characteristic of many Ecuadorans, particularly the agricultural workers. In the Sierra, many of the workers on the land are part of an almost feudal economy. They work for a meager wage and are usually in debt to the landowners. Low wages, coupled with rising costs of living, even before the sharp wartime advance in prices, have tended to make living conditions even more difficult. The supply of labor usually is sufficient for the customary level of production. During late 1942 and 1943, however, increased emphasis on the output of strategic commodities resulted in a tight agricultural-labor situation. As wartime production programs tapered off in late 1943 and 1944, many laborers returned to work in the fields.

TRANSPORTATION

Lack of adequate transportation facilities is one of Ecuador's most pressing problems. The railway from Guayaquil to Quito is at present the principal land connection between the coast and the Sierra and is the most important railroad in the country. Other short rail lines offer service part of the time between a few towns. All-weather highways are nonexistent in the littoral or coastal area and are few in number in the Sierra, being limited to the completed section of the Pan American Highway and a few side roads. Travel between most towns and villages is over mule trails or footpaths.

Development of Agriculture

Agriculture, including forestry, furnishes the major portion of the exchange for the purchase of imports (fig. 3). In spite of the emphasis on agriculture, however, relatively little of the land area is under cultivatiton. The Oriente region and the Pacific littoral have few settlers and are little developed, the Sierra and Guayas Basin having the largest areas of cultivated land (table 1). Of the 15,000,000 acres of undeveloped land on the coast, estimates indicate that 6,700,000 can be "easily" adapted to cultivation with "little" work. A similar estimate for the Sierra was placed at 2,500,000 acres. Much of this land, however, would require expensive irrigation systems and transportation facilities for profitable cultivation.

TABLE 1.—*Estimated distribution of land in the Sierra and on the coast of Ecuador* [1]

Land use	Sierra		Coast	
	1,000 acres	*Percent*	*1,000 acres*	*Percent*
Natural or planted pastures	2,520	15.9	1,236	7.2
Rotation crops	1,118	7.0		
Cultivated land	794	5.0	923	5.4
Public lands	[2] 5,580	35.1	6,775	39.5
Paramo (13,000 feet above sea)	1,132	7.1		
Other undeveloped land	4,747	29.9	8,228	47.9
Total area	15,891	100.0	17,162	100.0

[1] Cultivated land in the Oriente is estimated at approximately 50,000 acres.
[2] Subtropical region, mostly public lands.

DIRECCIÓN NACIONAL DE ESTADÍSTICA. ECUADOR EN CIFRAS 1938-42. 502 pp., illus. Quito. 1944; LINES, DAVID A. ECUADORAN HIDE AND SKIN INDUSTRY. U. S. Cons. Rpt. No. 227 (Enc. No. 1). Quito. Dec. 11, 1944.

Large-plantation agriculture is particularly prevalent for those crops grown on the lowlands for export, whereas in the Sierra there are numerous small farms in addition to the larger holdings. In recent years some of the large estates have been reduced in size by subdivision among the children of the family, confiscation of individual and church property for subdivision, purchase of small blocks of land, and grants by the Government, or original property owner, to small farmers.[3] Recent legislation has authorized the condemnation of lands for subdividing and parceling to small holders. The large landholders, however, are beginning to cooperate to offset this movement.

LAND TENURE

Communal ownership of land is common in parts of the Sierra. The church, banks, and other institutions own numerous properties. Large companies producing bananas and sugar, while important in the development of these commodities, own only an insignificant proportion of the total land area. A sizable, but practically indeterminate, portion of the total land area belongs to the State.

Land is farmed under various systems of tenure, including owner operation, cash rental, lease or concession, community ownership, and modifications of the old *encomienda* system, which was de-

[3] Report of the Ecuadoran Economic Resources Mission, 1941–42. [Unpublished manuscript.]

signed to provide an adequate labor supply for the landowners. Tenant-farmer employment on the lands of absentee owners has long been characteristic of Ecuador's economy. Although actual peonage is prohibited by law, farm operation in many places still resembles that of feudal lords.

Both owner operation and cash tenancy are confined primarily to small properties. Variations of a tenure system that provides labor for the *hacendado* or farm owner are practiced throughout the coastal and highland regions. In the Sierra the system is known as *huasipungo*. Under it, the farm worker is allotted a small piece of ground on a plantation for his own use for an indefinite or unlimited period. He is permitted to build his own home, plant a garden, and keep a few livestock. In return, he must work on the plantation for a specified number of days each week for a small wage. Should the plantation be sold, the *huasipungueros* remain on the land to work for the new owner. Most of these workers become indebted to the hacendado, and they cannot leave the plantation for other employment until the debts are repaid.[4]

In the coastal areas, where the supply of labor is limited, particularly in the rice fields, *sembradores*, as they are called, are prevalent. The sembrador receives plants or land to cultivate from the owner, who contracts to buy the produce grown. Also important on the coast are the *jornaleros* or day laborers who may receive from the owner of a farm a certain quantity of land to cultivate for their own use. Until recently they paid a certain percentage of the produce for the use of land.

In the Province of Bolívar the farm worker paying for the uce of certain land by his labor on the plantation of the owner is known as a partisan. Under still another system, which is most general in the Province of Imbabura, centers of population ownland collectively and are known as communities. Port of the land is divided into blocks to be worked by individuals, and part remains as "common land" to be cultivated collectively.

METHODS OF CULTIVATION

Relatively little scientific farming is practiced in Ecuador. Under the prevailing system of absentee ownership and sharecropping, both management and labor throughout many farming areas are unskilled in improved methods. Mechanized equipment is used on only a few of the larger estates. Wooden plows with an iron point are drawn by oxen or horses throughout the Sierra, although wooden plows with iron blades are being used increasingly. The machete and the hoe, however, continue to be the most important farm implements in planting, cultivating, and harvesting the crops. Agricultural workers do not yet know how to operate modern equipment or how to take care of it. The peculiarities of the terrain check the use of machinery. In addition, the high initial and maintenance cost of mechanization precludes its adoption by the small farmer, and many of the larger landowners are not yet convinced of its profitability. Imports of all kinds of agricultural machinery before the war averaged in value only a little more than $200,000 a year. Of this amount, by far the largest percentage was spent for tractors and tractor parts.

Fertilizers are not extensively used. Parts of the coastal region can produce abundantly without fertilizers, and until recently farmers in the Sierra have not used them. Intensive cultivation and lack of proper rotation in the highlands have, however, caused a deterioration of the soil.

Several small irrigation works are in operation, although they do not service a significant portion of the agricultural land. In the summer of 1944 a National Irrigation Bureau, a semiautonomous Government agency, was established to study, construct, and develop systems of irrigation. It operates under the authority of the Law of Irrigation and Soil Improvement (No. 258, July 3, 1944).

FIGURE 2.—Topography of area in Imbabura Province.

[4] BEARD, JOHN M. ECUADORAN LABOR AND LAND USE. U. S. Cons. Rpt. No. 89. 9 pp. Quito. Aug. 28, 1944.

MARKETING MECHANISMS

Marketing of agricultural produce for local consumption is a simple process. Throughout the highlands and, to a lesser extent, on the coast fairs are held regularly in the villages and towns. Farmers from the surrounding country bring whatever they have to sell—a bushel of beans, a bag of potatoes, etc.—to the fair; sell it; and purchase their own supplies with the proceeds from their sales. In the lowlands the markets or fairs are usually in villages along the rivers. From a week to a month may be consumed in collecting the products and transporting them by muleback or human effort to the river. Part of the produce is sold at the river, and transportation down to the ports is taken care of by brokers or exporters. Other produce is taken down the river on rafts by the producers themselves.

A number of large companies, or plantations, control the production and marketing process for the crops they produce from the planting of a crop to its sale to wholesalers or retailers abroad. A limited quantity and variety of products for export originate in the Sierra. As a rule, these commodities are shipped to Quayaquil for export.[5]

Crop Pattern

Of the two settled areas of Ecuador, the Guayas Basin produces primarily commercial crops for export (table 2), and the Sierra confines itself almost exclusively to production for domestic use. Difficulties of transportation between the coast and the highlands have helped to produce two entirely dissimilar regions having little interrelationship. The principal crops of the coast are rice, cacao, coffee, and bananas; whereas the products of the Sierra are wheat, barley, corn, potatoes, and rye (table 3).

For many years cacao was the leading commercial crop, but during the past few years increased production of rice, together with reduced yields of cacao, raised rice to first place as an export crop. The relative position of the different commercial crops has shifted from time to time. The importance of coffee has been increasing, and banana exports have been significant in some years. (See fig. 3.) Cacao occupies more than half the cultivated land on the coast, although 80 percent of the area is said to be diseased and virtually abandoned (fig. 4).

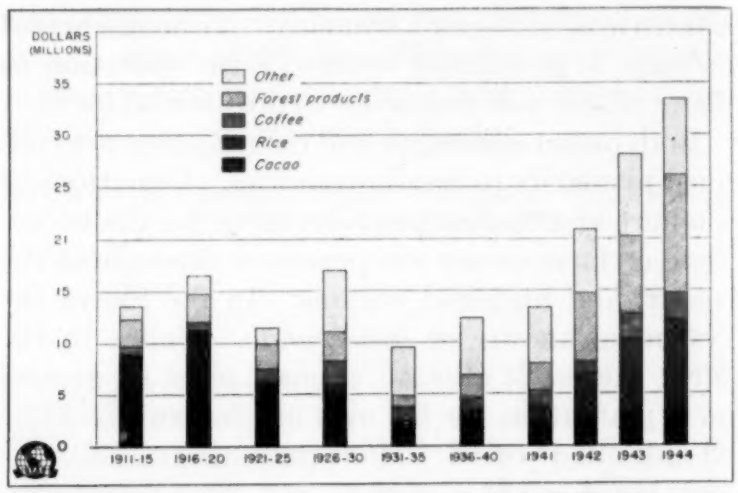

FIGURE 3.—Exports of specified products from Ecuador, 1911–44.

Export Crops

RICE

Rice production has been increasing since World War I. Before that time imports were necessary to supplement domestic production, but Ecuador became a net exporter during the 1920's. During World War II, the reduced supply of rice available from the Orient sharply stimulated the export demand for this cereal (table 2) and put Ecuador in third place among Western Hemisphere rice-exporting countries. During the 3 years 1942–44 rice ranked first in the value of all Ecuadoran exports. Cuba and Peru are the best markets, although small quantities go to other Latin American countries, notably Panama and Venezuela.

Domestic consumption of milled rice, which is the principal food crop of many people on the

TABLE 2.—*Exports of specified products from Ecuador, 1911–1944*

Period	Rice	Cacao	Coffee	Bananas	Hides and skins
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 stems* [1]	*1,000 pounds*
Average:					
1911–15	33	89,562	7,240	85	2,026
1916–20	42	96,004	5,478	72	2,284
1921–25	4,043	81,184	11,347	233	1,415
1926–30	15,549	47,000	16,691	811	1,473
1931–35	21,863	35,110	20,648	1,044	1,063
1936–40	25,684	38,631	30,626	2,296	1,133
Annual:					
1941	46,641	31,819	26,118	1,512	1,312
1942	85,206	30,338	14,330	996	1,772
1943	103,599	40,038	27,205	677	456
1944	142,426	30,313	31,874	598	101

[1] 50-pound stems; 1911–42 converted from kilogram weight, thereafter converted from number of stems as reported, assuming an average weight of 55 pounds to the stem.

Official trade statistics and consular reports.

[5] Based on an unpublished manuscript prepared by Lawrence W. Witt, Office of Foreign Agricultural Relations.

coast, averaged from 55,000,000 to 75,000,000 pounds a year before the war and increased sharply in 1943. Steadily expanding production has, however, taken care of this increase and provided substantial quantities for export (table 4).

TABLE 3.—*Production of principal crops in Ecuador, by Province, 1942*

Province	Wheat	Potatoes	Rye	Lentils	Corn	Barley
Sierra:	*Bushels*	*Bushels*	*Bushels*	*1,000 pounds*	*Bushels*	*Bushels*
Azuay	24,728	20,282	.....	.....	272,859	28,660
Cañar	25,573	96,708	.....	.....	201,721	159,007
Carchí	142,711	105,159	.....	.....	110,112	49,787
Cotopaxi	48,575	662,887	172,038	.....	119,167	543,250
Chimborazo	126,066	307,688	.....	2,421	118,970	398,849
Bolívar	20,135	20,650	.....	370	218,531	125,846
Imbabura	90,793	129,373	.....	49	377,696	83,040
Loja	20,282	7,422	.....	.....	235,892	35,825
Pichincha	349,209	456,316	.....	.....	453,951	244,481
Tugurahua	43,504	130,512	36,218	.....	272,859	255,872
Total	891,576	1,936,997	208,256	2,840	2,381,758	1,924,617

Province	Cacao	Coffee	Rice	Cotton (ginned)	Oranges	Bananas
Coast:	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Bales*	*1,000 units*	*1,000 stems*
El Oro [1]	2,302	2,434	.....	.....	34,000	250
Esmeraldas	121	.....	1,177	35	3	22
Guayas	6,054	5,924	121,934	742	45,000	625
Los Ríos	24,120	2,496	40,106	106	21,000	126
Manabí	1,731	10,912	104	11,667	9,000	107
Total	32,026	19,332	163,321	12,550	75,003	[2] 880

[1] Data for El Oro are for 1940 and are not included in total given. No data are available for El Oro in 1941 and 1942 because of Peruvian occupation.
[2] A decline from 4,568,000 stems in 1941.

MINISTERIO DE AGRICULTURA, INDUSTRIAS, MINAS Y TURISMO. INFORME A LA NACIÓN. 101 pp., illus. Quito. 1943.

The Guayas River Basin is the rice-producing area, the Province of Guayas alone accounting for three-quarters of the total production. There are two crops, *Vega* and *Invierno* or winter harvest. Vega rice, grown on the river flats during the dry season, is planted in April and May and harvested from October to December. The Invierno crop, grown on the higher fields during the wet season, is planted in December and January and harvested from May to July. The Invierno is the larger crop, accounting for four-fifths of the yearly total. As the export market has developed, the predominant variety grown has shifted from Fortuna to Canilla, which is more resistant to disease and insect damage.

TABLE 4.—*Rice production and trade in Ecuador, 1939–44*

Year	Production	Net exports
	1,000 pounds	*1,000 pounds*
1939	97,066	21,598
1940	88,521	40,626
1941	124,736	46,628
1942	167,228	85,206
1943	222,532	103,599
1944	177,706	142,426

Until recently, virgin land was cleared each year for the planting of rice and after harvest was allowed to go back to jungle. This newly cleaned and burned-over land received no further preparation before planting. A few weedings and some protection against bird damage constitute the cultivation and care of the growing rice. Harvesting is performed by hand with a machete, the shocks are dried in the sun, and the rice is threshed by beating the shocks on the ground.

Tenant farmers—sembradores—cultivate from 70 to 90 percent of the rice. These tenants shift readily to other crops when the price of rice is low. Until mid-1944 the usual practice was for the tenants to pay as rental, for the use of the land, a certain quantity of rice. At that time a decree, issued first in 1938 (No. 136 of June 11) and revoked in 1939 (No. 27, September) was revived, and this provided for cash rentals.

Rice mills are scattered throughout the growing areas, usually in towns along the rivers. The farmers take their dry, unhusked rice to the mill, where

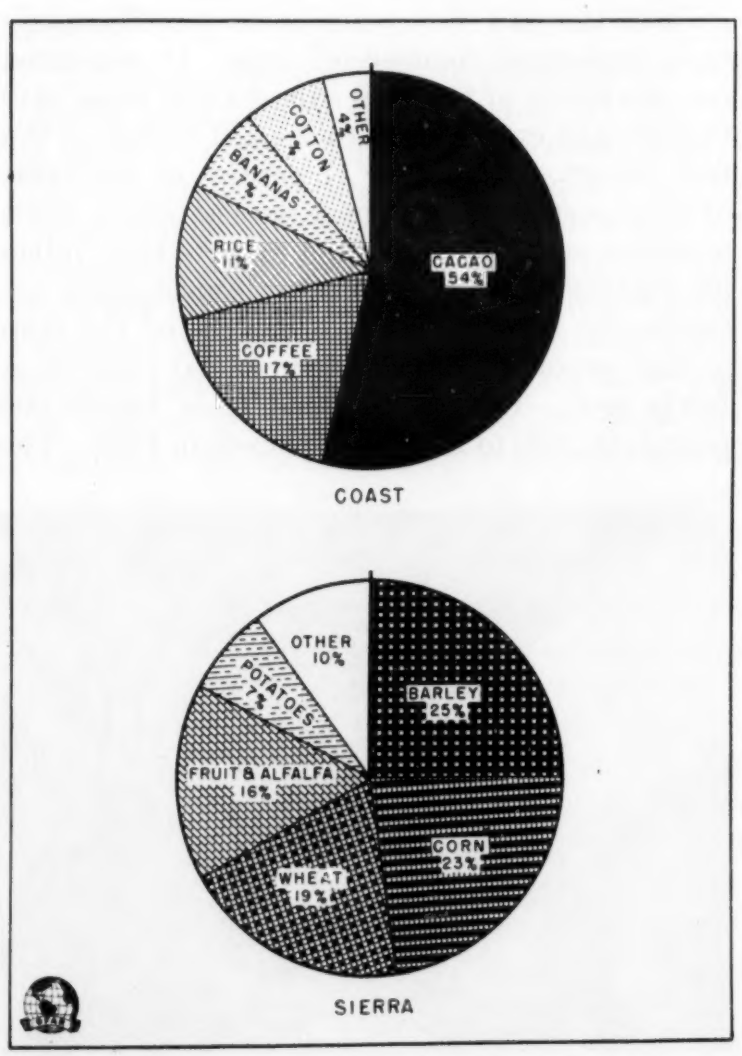

FIGURE 4.—Estimated area of principal crops as percentage of total cultivated area in Ecuador, 1941.

they obtain a *recibo* (receipt) representing 100 pounds of clean rice for each 162 pounds of rough rice that they deliver. The recibo is negotiable and is usually sold to a broker or exporter. Many times the brokers advance the farmer money on the growing rice, taking an option to buy the entire crop.

Regulations governing the operation of rice mills were prescribed in April 1938 (Decree 209) to be carried out by the *Control de Piladoras* (Division of Rice Mill Control) now under the Ministry of Economy. In order to protect the interests of domestic consumers, the Government in November 1942 imposed a ban on exports which lasted until May 1943. Increased production and carryovers, however, made it possible to relax the regulations and permit exports of certain quantities. Frequent changes in these export policies have been made since then. Prices to be paid for the use of land as well as those for the domestic rice crop are set by decree, but enforcement is difficult.

CACAO

Until the past few years cacao was Ecuador's most important commercial crop. It accounted for two-thirds of the total export value from 1910 to 1920, and even in 1941 cacao still ranked as the first export, constituting 17 percent of the value of all exports. Diseases have devastated the trees, however, and production and exports have fallen off sharply. Average domestic consumption accounts for not more than 5 percent of the crop so that export statistics measure total production fairly well. Exports dropped from 103,000,000 pounds in 1920 to 23,000,000 pounds in 1933. The 1943 crop was the best in recent years, but the 1944 crop did not exceed 75 percent of the previous harvest. Disease and inadequate labor supplies were prime factors in causing a drop in Guayaquil deliveries, which amounted to 30,000,000 pounds in 1944.

FIGURE 5.—Cacao pod of the red, or Venezuelan, type on the tree.

France was the principal market in the years immediately preceding World War I, with the United States in second and Germany in third place. Although during the war almost two-thirds of the product went to the United States, European markets expanded rapidly during the 1920's and 1930's. Germany, France, Great Britain, Spain, and the Netherlands were all important buyers. During World War II the United States again dominated the market, but the other American Republics, particularly Peru, Mexico, and Colombia, took some quantities at prices higher than those offered in the United States. Before this war (1939 and 1940) Ecuador furnished 2.4 percent of all the cacao imported into the United States, being the sixth most important supplier. Cacao for entry into the United States is bound on the free list.

Most of the cacao is grown on large plantations in the Guayas Valley. The province of Los Ríos usually produces more cacao than all the other Provinces combined. El Oro Province, bordering Peru in the south, is also an important producer, and small quantities of the bean are grown in Manabí and Esmeraldas. Cacao is harvested throughout the year, the time of harvest depending on the location of the trees. The principal crop, the Red Summer Arriba, is harvested from March through June, and an intermediate crop, known as Arriba Superior, is picked from July to November. The *Cosecha de Navidad* (Christmas crop) begins in December and lasts through February. The bulk of the Christmas crop is produced in Los Ríos and is considered to be the finest product.

When a cacao plantation is to be established, the land is cleared, except for rows of trees about 75 feet apart, which are used to shade the young cacao seedlings. Cacao is first planted in seedbeds and then transplanted to the permanent fields. The tree does not come into full bearing until about the sixth year. The pods containing the beans grow along the trunk of the tree (fig. 5). After they are harvested, they are opened with a machete. The beans, from 20 to 40 of them from each pod, are fermented, dried in the sun on drying floors, and bagged for transport to Guayaquil.

The monilia disease first attacked the plantations in 1917, causing a 20-percent decline in production during the first year. This is a fungus growth, which causes the pods to decay. It spread rapidly, particularly during the rainy seasons, and destroyed almost all the pods on many plantations. A certain degree of control was effected by keeping the ground free of underbrush, planting the trees farther apart, and pruning. In 1922, however, another disease, witches'-broom, appeared and further devastated the plantations. Production declined steadily through 1942, and many farms were abandoned. Development of disease-resistant strains so far has proved to be the most effective method of combating this disease. The Government is sponsoring such development through experiments at its stations, on private plantations, and in the cooperative station at Pichilingue.

COFFEE

Until 1942 coffee was second only to cacao as a cultivated commercial crop. Both production and exports showed a steadily rising trend from 1920 through 1940. Low coffee prices during the 1930's, however, reduced the total value of the crops. Peruvian occupation of the Province of El Oro, one of the principal producers, during 1941 and part of 1942 reduced production and exports, but both increased in 1944 to near-record levels.

Coffee is grown in the western coastal regions and on the western slopes of the Andes. Manabí is the largest producing Province, but Guayas, Los Ríos, and El Oro produce important quantities. Some years ago coffee was grown on large plantations as a supplement to the cacao crop, but more and more its production is becoming a small-farm enterprise. Production methods are simple, with little use of machinery or fertilizer. No new plantings have been reported since 1941. The number of producing trees was estimated at 40 million on October 1, 1944.[6]

The berries are harvested from June through August, usually by women and children; then the beans are depulped, dried, hulled, and bagged for shipment. About 90 percent of the product is exported. It is sold by the farmer either directly to the exporter or to commission men who in turn sell it for export. Until recently Guayaquil was the principal seaport for coffee, but Manta is increasing in importance.

[6] Cable No. 321, November 13, 1944, from U. S. Consul General in Guayaquil.

TABLE 5.—*Coffee exports from Ecuador to the United States and export quotas, 1939–44*

Year beginning October 1	Exports to United States	Quota for United States market
	Bags of 132 pounds	*Bags of 132 pounds*
1939	209,942	
1940	212,706	156,699
1941	97,571	222,377
1942	185,205	264,910
1943	179,324	197,733
1944	151,033	211,459

Before the war France was the leading market, with the United States second. The United States now takes the major part of the crop and the other American Republics the remainder. Exports are regulated by the Inter-American Coffee Agreement, which became effective in late 1940. The quota for the United States market has been greater in most years than the quantities actually shipped (table 5).

FRUIT

Although a few oranges and other fruits are exported from time to time, bananas are the only fruit of commercial importance, accounting for 80 percent of the total value of fruit shipments. Bananas did not rank as one of Ecuador's principal commercial products until the middle 1930's, when they rose to fourth place in value of total exports. Wartime shipping difficulties, however, have sharply curtailed exports from an annual average of 2,296,000 stems in 1936–40 to 598,000 in 1944 (table 2). Before the war approximately as many stems were used domestically as were exported. Prior to 1934 Chile was the best export market, with Peru taking small quantities. In 1934 a United States company established a branch office in Ecuador, developed a large banana plantation, and began regular shipments to the United States. By 1939 more than half the total was moving to that market. Lack of refrigerated ships during the war years practically eliminated shipments to the north, and Chile resumed its former place as the principal market.

Guayas produces more than any other Province. Within this Province the major banana zone at present lies east of Guayaquil along the banks of the Chimbo (Yaguachi) River. Another zone about 60 miles south of Guayaquil is one of the

most promising areas, with excellent soil and climate. A large plantation is now located there. Transportation to Guayaquil from both these sections is by river craft. East of Guayaquil in the canton of Milagro and surrounding territory is one of the oldest producing areas. It borders the Guayaquil-Quito Railway, which transports the fruit to Guayaquil.

The plantations in El Oro are centered around Machala, Pasaje, and Santa Rosa. They are small and as a rule poorly maintained. The Los Ríos region of production is about 80 miles north of Guayaquil. When transportation to market is improved, production there should expand rapidly. Small quantities of fruit are produced also in Manabí and Esmeraldas. (See table 6.)

Panama disease has ruined many fields, but as yet sigatoka has not been reported in Ecuador. With reduced shipment during the war, many other fields have been abandoned, particularly by small farmers.

The large fruit companies are maintaining certain of their plantations to provide planting stock when shipping is again available. The company owned by United States interests has a contract with the Ecuadoran Government, negotiated in 1937, which provides that bananas will be subject to only one tax—an export tax of 0.15 sucre (1 cent) per stem, two-thirds of which will be paid by the exporter and one-third by the producer. In addition, bananas are subject to varying municipal charges.

TABLE 6.—*Principal commercial banana areas*

Province and zone	Estimated area in 1942	Estimated potential area
Guayas:	*Acres*	*Acres*
Chimbo	7,140	15,980
Tenguel	1,700	17,000
Railroad	4,500	12,000
Balao-Naranjal-Taura	2,210	11,050
Boliche	1,275	7,140
El Oro	340	17,000
Los Ríos	425	85,000
Total	[1] 17,590	165,170

[1] 1944 estimates of area in commercial production dropped to 8,000 acres.

BURDETTE, WILLIAM C., JR. BASIC BANANA REPORT—1942. U. S. Cons. Rpt. No. 22,073. 13 pp., illus. Guayaquil. Aug. 15, 1942.

Oranges are the second most important of the fruits exported, most of them going to Peru and Chile. Guayas and El Oro Provinces are the principal producers. With the exception of one large plantation in El Oro, the fruit is grown in small, scattered groves that are not systematically cultivated. Pineapple production is confined to the Milagro zone east of Guayaquil and is largely on plots of 2.5 acres or less. The small exports (table 7) of pineapples, as well as sporadic shipments of other fruits, go principally to Peru and Chile.

TABLE 7.—*Exports of minor fruits from Ecuador, 1936–43*

Fruit	Average 1936–40	1941	1942	1943
	1,000's	*1,000's*	*1,000's*	*1,000's*
Oranges	30,490	14,355	17,295	7,838
Pineapples	132	129	120	66
Mangoes	5,155	2,693	1,861	293
Limes	560	342	87	0
Avocados	[1] 42	1	39	0
Mammees	[2]	0	6	0
Apples	3	29	3	[2]
Naranjillas	180	0	0	[2]

[1] 1,000 pounds.
[2] Less than 500 units.

Official statistics through 1941; thereafter GREEN, CASPAR D. ECUADORAN FRUIT INDUSTRY. U. S. Cons. Rpt. No. 1. 9 pp., illus. Guayaquil. Jan. 5, 1945.

Mangoes and limes are products of the coastal regions, whereas avocados grow both on the coast and in the Sierra. Ambato and Cuenca are the principal producers of the temperate-belt fruits—apples, peaches, plums, and pears. Other fruits produced in the highlands for sale in local markets (fig. 6) include chirimoyas, naranjillas, figs, wild cherries, granadillas, and strawberries. Inadequate transportation facilities preclude production of Sierra fruits for export. Fruit is important in the local diet, however, both in the highlands and coastal regions. In addition to local production, about 440,000 pounds of fresh fruit are imported each year, as well as small quantities of dried and preserved fruits.

FIGURE 6.—Fruit stand near the wharf at Babahoyo, Ecuador.

Food Crops for Domestic Use

In addition to rice and bananas (see export crops), the principal food crops are sugar, wheat, potatoes, corn, and beans. Usually Ecuador produces enough of all these for its current level of consumption, with the exception of wheat. During the past few years, however, other foods have been in short supply, particularly sugar.

GRAINS

After rice, corn and wheat are the most important grains, followed by barley and rye. Except for rice and corn, cereals are produced primarily on the plateau, whereas corn is grown both in the highlands and on the coast. Pichincha and Imbabura are the principal corn-producing Provinces, accounting for more than a third of the total Sierra production; Pichincha is by far the most important wheat producer; Cotopaxi and Chimborazo produce the most barley; and Cotopaxi provides 83 percent of all the rye.

Small quantities of corn and barley are exported from time to time to neighboring countries. The net annual exports of corn from 1939 through 1941 averaged 679,000 pounds and of barley, 30,000 pounds. These amounts are insignificant compared with an estimated production of 117,000,000 and 86,000,000 pounds, respectively.

Wheat, on the other hand, is not grown in sufficient quantities to supply the market. Most of the product is imported as wheat flour, although small quantities of the grain move in foreign trade. Mills in the Sierra process the domestic grain for use largely in the highlands, whereas the coastal areas depend on imported wheat flour (table 8).

Flour imports have provided an important addition to Ecuador's food supply for many years. They averaged 14,500 pounds from 1911 to 1915 and gradually increased to 51,000,000 pounds in 1942. The United States and Argentina are the principal suppliers, with the United States leading, except for the year 1943, when Argentina shipped somewhat more than half the total. During the early years of World War II, flour supplies were low because of inadequate shipping space. In 1944, however, flour began to arrive from the United States in large quantities, the total from that country reaching four times that of the previous year.

TABLE 8.—*Wheat production, trade, and disappearance, 1939–44*

Year	Estimated production		Net flour imports	Apparent disappearance	Imports as percent of disappearance
	Grain	In terms of flour [1]			
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*Average*
1939	49,692	36,076	36,292	72,368	
1940	61,993	45,007	18,336	63,343	
1941	54,185	39,339	25,437	64,776	
1942	53,495	38,836	51,447	90,283	46.1
1943	47,253	34,306	21,742	56,048	
1944	[2] 53,748	39,021	45,329	84,350	

[1] Converted at 72.6 percent.
[2] Preliminary.

MINISTERIO DE AGRICULTURA, INDUSTRIAS, MINAS Y TURISMO. INFORME A LA NACIÓN. 101 pp., illus. Quito. 1943. LINES, DAVID A. SPECIAL INFORMATION ON THE ECUADORAN WHEAT PRODUCTS, MILLING AND BAKING INDUSTRIES. U. S. Cons. Rpt. No. 82 (Enc. No. 1), 6 pp. Quito. Aug. 18, 1944.

The Ecuadoran Government is anxious to increase wheat production and make the country less dependent on outside sources of supply. In mid-1943 a number of decrees were issued, looking toward this objective. They provided regulations pertaining to sowing, harvesting, transportation, sale, and distribution of wheat and wheat flour. Because of the difficulty of complying with these regulations, modifications have been made, but the Government still controls sales and distribution.

SUGAR

Most of the country's sugar production is on the west coast. Some sugarcane is grown in the Sierra, the area devoted to the crop being in the neighborhood of 47,000 acres, largely in the Province of Imbabura. The sugar harvest begins in July, and the grinding season usually lasts about 6 months, sometimes running on into early February of the following year.

In addition to the production of white sugar, cane is processed into *raspadura* or panela, a brown, loaf sugar, and into alcoholic beverages by the Government monopoly. (See table 9.) The Province of Loja is by far the most important producer of panela, having accounted for 84 percent of the total in 1942. Two mills produce three-fourths of the white sugar.

During the 1920's and early 1930's Ecuador produced enough sugar for its own needs and exported small quantities. Beginning in 1934, however, and lasting through 1938, imports were necessary to meet domestic needs. During the past 2 years sugar has been in very short supply. Production has declined somewhat, but the shortage

is attributed to increased consumption, particularly for use in the production of alcoholic beverages.

TABLE 9.—*Estimated sugar production and trade of Ecuador, 1934–44*

Year	Production		Sugar used in *aguardiente*	Imports	Exports
	White sugar	Panela			
	Short tons	*Short tons*	*Short tons*	*Short tons*	*Short tons*
1934	22,057	(1)	5,135	3,278	84
1935	21,043	(1)	8,009	5,309	86
1936	20,029	(1)	9,941	7,913	58
1937	19,116	(1)	11,304	5,853	11
1938	24,795	(1)	11,893	12,200	131
1939	29,612	(1)	9,449	13,654	154
1940	30,931	(1)	9,196	42	190
1941	33,871	12,755	9,342	8	119
1942	31,083	10,079	10,850	36	201
1943	29,258	1,010	11,081	203	(2)
1944	25,505	10,864	12,544	[3] 8,522	(2)

[1] Not available.
[2] If any, negligible.
[3] Official figure, but subject to revision; trade circles believe amount to be twice this figure.

LINES, DAVID A. SUGAR SHORTAGE CONTINUES AS A DISTURBING POLITICAL FACTOR IN ECUADOR. U. S. Cons. Rpt. No. 45 (Enc. No. 5). 5 pp. Quito. May 13, 1944; GREEN, CASPAR D. ECUADORAN SUGAR SITUATION AS OF JANUARY 1, 1945. U. S. Cons. Rpt. No. 13, 6 pp., illus. Guayaquil. Jan. 30, 1945.

Early in 1942 exports were prohibited, and price-control measures were tightened in order to protect the consumer against sugar shortages and high prices. On January 31, 1944, a decree established Government control over all phases of the sugar industry from cultivation to retail sale. Little improvement was noted in sugar supplies, however, and later in the year (Decree No. 20 of August 24, 1944) a new program was announced. Its principal features are: Government monopoly of domestic sugar production and imports; control of distribution, which is to be channeled through Municipal Government Food Depots and nonprofit organizations whenever possible; price fixing for both producers and consumers; and a general policy aimed at making Ecuador self-sufficient in sugar production within 2 years.

VEGETABLE OILS

Production of vegetable oils and oilseeds is insignificant in Ecuador. Castor-beans, coconuts, palm kernels, and cottonseed are the more important domestic sources of oils. Before the war fairly large quantities were imported for use as food and in paints, varnishes, and soap. During the past 3 years production of castor-beans has increased sharply, and exports have been made to the United States and Argentina. Coconuts and palm kernels have been good sources of oil, particularly for soap. The trees grow wild in many of the coastal regions, particularly in the Provinces of Manabí and Esmeraldas.

Cottonseed production declined from 15,200,000 pounds in 1939 to about 8,600,000 pounds in 1944. Although peanuts are grown, annual production averaging about 1,100 short tons, they are all used for food in the kernel form rather than for oil. Sesame, kapok seed, and soybeans are available in small quantities. Many sections of the country are suited to the production of oilseeds, but processing equipment is scarce. Domestic production has not been able to replace the oil formerly imported. In order to conserve existing supplies, the exportation of oleaginous seeds after February 28, 1945, was prohibited.

VEGETABLES

The principal producing area for the staple vegetables—potatoes, beans, and onions—is in the highlands, although vegetables are also produced on the coast. The greater part of these products are grown for local use. Production is carried on largely by small operators, and the products are transported to the market as maturity is reached. Small quantities of the less perishable crops—potatoes, beans, lentils—are shipped to neighboring countries and other parts of Ecuador. Transportation difficulties prevent a large export movement of perishables. (See table 10.)

Raw-material crops

Tobacco production, which is centered in El Oro and Guayas Provinces, is a relatively minor segment of Ecuador's agriculture. It does provide the raw material, however, for the tobacco-processing industry, little leaf tobacco being imported. Production has declined steadily in recent years. The total area planted in 1944 was just over 7,400 acres, and the normal crop amounts to about 3,300,000 pounds.

Seedbeds are prepared in February, and the plants are moved from the beds from April through June, depending on location. Harvesting begins in July in the higher elevations and ends in September in the lowlands.

The tobacco industry, from cultivation to retail sale, is controlled by a Government monopoly, *El Estanco de Alcoholes y Tabacos*. The Estanco makes crop loans to farmers, issues permits for planting and harvesting, sets standards of classi-

fication and prices, and controls the sale not only of the crop but of the manufactured products as well. It also regulates all foreign trade in tobacco or tobacco products. Few exports are made, but imports of cigarettes from the United States are increasing in volume.

Domestic cotton is not sufficient in quantity to supply the needs of the local textile industry, which is at present by far the most important manufacturing industry in the country. In fact, production has been declining in the face of an expansion in cotton-textile output aimed at replacing cheap textiles formerly imported from Japan. Just north of Guayaquil in the Province of Manabí is the center of the cotton-growing region, whereas most of the mills are located in the highlands. In an effort to increase local cotton supplies, the Government in 1935 prohibited imports. Production did not respond, however, and imports from other Latin American countries have been necessary. Free distribution of seeds and crop loans are more recent Government methods to encourage output. In addition to an estimated 1944 crop of 7,350 bales, however, imports of 9,200 bales were needed for the mills.

Government Policy

Before the war governmental policies affecting agriculture were confined primarily to measures controlling trade. Particularly during the 1930's, import duties were increased several times in an effort to encourage expansion in domestic production. Control of foreign exchange and export prohibitions have been used from time to time to protect domestic agricultural industries. Government monopolies of certain products are also operating.[7]

After World War II started, the use of trade controls was intensified and supplemented by internal controls directed toward development of agriculture and industry and the control of prices. Import duties were increased on many commodities, and machinery was set up to strengthen the control of imports and exports in the interest of domestic producers and consumers. More direct measures were also taken to improve the internal economy and provide strategic materials needed by the Allied Nations.

[7] For a full discussion of economic controls, see UNITED STATES TARIFF COMMISSION. ECONOMIC CONTROLS AND COMMERCIAL POLICY IN ECUADOR. 25 pp., illus. Washington. 1945.

TABLE 10.—*Estimated vegetable production and trade in Ecuador, specified years*

Product	Estimated annual production	Exports			
		Average 1936–40	1941	1942	1943
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*	*1,000 pounds*
Potatoes	131,835	287	578	1,005	340
Beans	27,072	64	99	112	11
Beets	2,028	2	2	4	(1)
Cabbage	70,988	2	26	2	0
Carrots	7,606	9	18	11	0
Cauliflower	1,521	(1)	(1)	0	0
Garlic	(2)	66	117	4	0
Broadbeans	24,339	33	71	9	4
Lentils	4,564	397	216	106	106
Lettuce	15,719	(1)	(1)	(2)	(2)
Onions	45,635	18	110	7	0
Peas	15,212	55	15	1	4
Tomatoes	1,217	2	0	(1)	0

[1] Less than 500 pounds.
[2] Not available.

LINES, DAVID A. ECUADORAN HORTICULTURAL PRODUCTS. U. S. Cons. Rpt. No. 3 (Enc. No. 1), 4 pp. Quito. Jan. 6, 1945, and official trade statistics.

One of the steps taken in this latter direction was the establishment of the Corporación Ecuadoriana de Fomento (Ecuadoran Development Corporation), organized as a result of a contract entered into on August 7, 1942, by the Government of Ecuador, the Ecuadoran Development Corporation, and the Export-Import Bank of Washington. The work of the Corporation comprises three main branches: The program of the Corporation itself; emergency procurement program of rubber and cinchona, using funds of the U. S. Government; and the program of aid and rehabilitation of El Oro Province, utilizing funds of the Office of the Coordinator of Inter-American Affairs.

A comprehensive program designed to stimulate economic development was adopted under Decree No. 759, published August 29, 1944. The Ministry of Economy was given wide authority to control this development. Under the authority of this decree, a "Plan for Immediate Development" was issued in January 1945 (Decree No. 91). This plan includes agricultural, livestock, and industrial development, with primary emphasis on agriculture. An increase in domestic foodstuff production is contemplated, as well as greater output for export.

Livestock Industry

The livestock industry of Ecuador is relatively undeveloped, but it usually provides for the local consumption of meat and for small exports of hides and skins above domestic needs. Production of

lard is supplemented by imports, and small quantities of dairy products come in from outside.

According to the Livestock Census of 1941, there were 1,447,000 sheep, 1,200,000 cattle, and 819,000 hogs in the country (table 11).

CATTLE

Most of the cattle of Ecuador are criollos, although a few imports of purebred stock are being made in an effort to improve the quality of the herds. The Oriente and the Galapagos Islands together have less than 80,000 cattle; of the remainder, about 60 percent are in the highlands and 40 percent on the coast. Estimates indicate that 50 percent of the large farms in the Sierra derive a major share of their income from livestock.

TABLE 11.—*Numbers of livestock in Ecuador, by Provinces 1941, total 1939, 1941, and 1943*

Province and region	Cattle	Horses	Mules	Donkeys	Swine	Sheep	Goats
Sierra:	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*	*Thousands*
Carchi	70.0	10.8	2.0	3.7	46.0	100.0	0.8
Imbabura	100.0	15.0	3.0	10.0	58.0	140.0	2.7
Pichincha	180.0	5.7	4.0	14.0	35.0	230.0	2.8
Cotopaxi	80.0	7.8	2.0	15.0	90.0	300.0	6.0
Tungurahua	35.0	1.9	.9	3.7	96.6	150.0	2.0
Chimborazo	65.0	2.7	1.7	1.8	45.0	400.0	1.7
Bolívar	23.0	2.3	.9	.4	12.9	80.0	.3
Cañar	30.0	4.9	1.8	.8	6.0	20.0	.9
Azuay	35.0	6.0	1.1	.5	9.0	16.0	.8
Loja	65.0	3.0	1.9	3.0	15.9	10.0	300.0
Coast:							
El Oro	25.0	2.0	1.0	.5	2.2	.5	.2
Guayas	85.0	5.0	2.9	1.9	106.0	.4	3.0
Los Ríos	170.0	2.4	1.0	.4	51.1	.1	------
Manabí	95.0	13.0	5.3	3.8	225.0	.1	.7
Esmeraldas	50.0	1.3	.7	.3	15.9	.1	------
Oriente:							
Napo-Pastaza	5.9	(1)	------	------	.5	------	------
Santiago Zamora	1.1	.1	(1)	------	.4	------	------
Archipiélago de Colón [2]	70.0	33.0	.5	6.0	4.0	------	18.0
1941 total	1,185.0	116.9	30.7	65.8	819.5	1,447.2	339.9
1939 total	1,420.0	103.6	(3)	(3)	350.0	735.0	(3)
1943 total	1,120.0	117.0	31.0	66.0	836.0	1,430.0	340.0

[1] Less than 50.
[2] Galapagos Islands.
[3] Not available.

DIRECCIÓN NACIONAL DE ESTADÍSTICA. ECUADOR EN CIFRAS 1938–42. 502 pp., illus. Quito. 1944; LINES, DAVID A. ECUADORAN HIDE AND SKIN INDUSTRY. U. S. Cons. Rpt. No. 227 (Enc. No. 1). Quito. Dec. 11, 1944.

Official slaughterhouse statistics show an increase in slaughter from 31,000 head in 1940 to 118,000 in 1942. An additional 20 percent at least should be added to these figures for cattle killed outside the reporting slaughterhouses. Since there are no packing or meat-freezing plants in the country, all animals are killed and sold on the same day to the public.

Because of the greater demand for meat, particularly for veal, the increased slaughterings during 1941 and 1942 reduced total cattle numbers. In early 1943 an executive decree prohibited the slaughter of calves of less than 2 years of age in the national abattoirs. Reduced slaughterings in 1943 no doubt resulted in part from this decree.

There is little trade in live cattle, the net movement being outward in most years. In 1929, exports reached a peak of 15,000 head, but they declined thereafter until in 1942 only 971 were exported.

The livestock section of the Government's proposal for economic development includes plans for expansion of herds and improvement of strains.

About 15 percent of all farms in Ecuador are estimated to be dairy farms. Although a number of purebred cattle—Holstein, Friesian, Shorthorn, Red Polled, and Normandy—have been introduced, little has yet been done to produce first-class dairy herds. Fluid milk is transported from the dairy farm to the markets of Quito and Guayaquil, the two largest consuming centers, by muleback or by truck. Milk produced in the highlands also moves to Guayaquil by rail. Both these cities have small pasteurization plants, but estimates indicate that only about 5 percent of the milk produced on the coast is pasteurized. Probably 40 percent of the total milk supply is processed into butter and cheese. Small quantities of these two products enter foreign trade. In the prewar period 1935–39, for example, butter exports (net) averaged 31,000 pounds a year, going to Peru, Colombia, and Panama; and cheese imports (net) averaged 8,000 pounds. A small quantity of dried milk is produced, and plans are being made for the construction of a new plant.

During 1941 and 1942, fresh milk was scarce in the cities. The Government believed that an unusually large quantity of milk was being diverted to the manufacture of cheese and butter, particularly in the highlands for sale in the coast region. Early in 1943, an Executive Decree (No. 209) was issued requiring that all manufacturers of milk products operate under a special permit from the Ministry of Agriculture, which was charged with the responsibility of protecting the supply of raw milk to the public. Further restrictions became effective on June 20, 1944, when the transportation of butter and cheese from the Sierra to the coast was prohibited, except under special permit.

Cattle hides and skins had long been a substantial export item until 1944 (table 2). Before the war, Germany was the principal market, with the United States second. Since 1940, however, the United States has taken most of the shipments.

The heavy demand for hides and skins on the world market resulted in above-average exports in 1942. To conserve the existing supply for local tanneries and the shoe-manufacturing industries, the Government issued Decree No. 469 (March 24, 1943), drastically curtailing the export of hides and skins and increasing by 100 percent the existing export duties on these products. Exports of raw cattle hides were limited, and later in the year other decrees prohibited the export of all crude hides and skins. Exports dropped sharply in 1943, and some importation occurred.

OTHER LIVESTOCK

Sheep and goats are concentrated in the highlands. Few farms are devoted exclusively to these animals, but many small farms have several for home use. Slaughtering of these animals for meat increased sharply in 1941 but declined slightly in 1943. The decline in total numbers on farms between 1941 and 1943 was, however, attributed partly to disease.

Most of the Ecuadoran sheep are of Spanish origin, although there are a few crossbred sheep. The wool from crossbred sheep is sought by the domestic mills. The indigenous population of the highlands use the wool for hand weaving into ponchos and blankets. In addition, exports of carpet-grade wool are made more or less regularly. Annual exports during 1935–39 averaged 132,000 pounds. They jumped to 681,000 pounds in 1940, and to 1,213,000 pounds in 1941, but dropped to 2,200 pounds in 1942. Before the war, Germany and Japan were the principal markets; now the United States holds first place.

Hogs and poultry are produced throughout the country for meat. Hogs are divided about equally between the highlands and the coast. Slaughter of hogs has followed that of other meat animals, rising sharply in 1941 and 1942 and dropping off somewhat in 1943. There is little foreign trade in hog products, with the exception of lard.

Lard is produced commercially in the highlands and by the native population in their homes for their own use. Estimated production usually averages approximately half of domestic requirements. (See table 12.) Before the war, imports were largely from the United States, but, since 1942, Argentina has replaced the United States as the principal source of supply. During 1944, unusually large shipments were received, producing a glut on the market. As a result, local commercial production practically ceased during late 1944. Small quantities of lard are exported to neighboring countries across the border.

TABLE 12.—*Estimated production and imports of lard, 1939–44*

Year	Estimated production	Net imports	Apparent supply	Percent imported
	1,000 pounds	*1,000 pounds*	*1,000 pounds*	*Average*
1939	2,383	2,343	4,726	
1940	2,588	2,390	4,978	
1941	6,202	3,009	9,211	
1942	3,770	6,343	10,113	51.0
1943	3,369	4,978	8,347	
1944	(1)	[2] 9,515	(1)	

[1] Not available.
[2] 11 months only.

Forest Industry

Balsa, rubber, cinchona, and kapok from the forests of Ecuador played a vital part in the war. All these products had been important in trade for many years, but exports tripled after the war began. Most of the recent shipments have gone to the United States. Other important commercial products considered here as forest products are tagua nuts (vegetable ivory) and "Panama" hats made from toquilla straw. These have been significant in the export trade for many years. During the war, balsa exports advanced sharply and in 1943 were valued at $3,000,000 to make balsa rank as the country's third most valuable export.

Effects of the War

The effects of the war on Ecuador are divided into those pertaining to the total economy and those applying primarily to the commercial economy of the western lowlands. Scarcities, high

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prices of foodstuffs and other prime necessities, and shortages of labor at harvesttime constitute the principal elements in the impact of the war on the Sierra. Wartime expansion in production of strategic commodities was almost exclusively on the coast, where much of the industry, mining, and accessible forests are located. Indirect results are felt through increased emphasis on construction of transportation facilities and irrigation projects and the development of agriculture through experiment stations and crop loans.

Shipping space during the early days of the war did not permit sufficient imports of wheat flour and lard to provide the usual level of consumption of these items. Quantities of both these commodities are now abundant, but other foodstuffs are still in short supply as are many other items formerly imported. Prices are high, and the lower income groups find it difficult to procure food and clothing. Agricultural production costs have also increased, and labor is scarce under the current utilization practices. Labor has never been plentiful, but during the war increased activity in the cities and towns sometimes reduced the supply of agricultural laborers at times when it was badly needed in the fields.

The war, which cut off the Far Eastern supply of such materials as cinchona, rubber, kapok, and rice, stimulated the production of these commodities in the Western Hemisphere. Wartime uses of other products of which Ecuador was already a principal producer, such as balsa and tagua, sharply increased the world demand for these articles. The United States took the lead in extending encouragement to Ecuador to supply some of the strategic products. Assistance was given by building roads and other facilities to service the producing areas and by actual purchases of strategic products. These activities, as well as construction of military bases for hemispheric defense, drew labor from other occupations, increased the value of exports, and stimulated economic activity in general in the western lowlands.

Production and exports of Panama hats were expanded also as the supply of hats from southern Europe was cut off. Because of the strategic character of most of Ecuador's exports, shipping priorities did not present a problem, except for products requiring refrigeration. Even in 1944, however, construction activities were sharply curtailed, demand for balsa declined, and problems of readjustment began to appear.

Postwar Problems

In the immediate postwar period the difficulties associated with reduced demand for the commodities whose production was stimulated by the war will present the acute problems. Lack of technical knowledge and improved agricultural methods, inadequate transportation facilities, and poor health and sanitation conditions, however, will continue to call for improvement in the basic economic pattern. The Sierra is suffering from intense exploitation of the soil, parts of it already being seriously eroded. The fertile, virgin soils of the western littoral, on the other hand, are largely undeveloped because of inaccessibility and unhealthful living conditions. The former source of wealth for the Guayas Basin—the cacao industry—is suffering from diseases that should be studied intensively by experts to determine control measures. Efforts to solve these fundamental problems were intensified during the war.

The biggest food-export problem seems to center around the crop that has expanded so rapidly under stimulus of wartime shortage—rice. As demand for the strategic crops fell during 1944, part of the labor occupied with those crops shifted into rice cultivation to increase its production further. Ecuador's future as a rice-exporting country, however, will depend on its ability to compete with the product of Siam and Burma in the world market. The prospects for revival of the once important cacao industry depend largely on the success, or failure, of experimental work in the control of disease. Assuming that some kind of control mechanism for coffee remains after the war, such as the Inter-American Coffee Agreement, this crop should continue to be one of Ecuador's staple export crops. When refrigerated shipping space is again available, bananas probably will regain their former place in the export trade and may even increase in relative importance.

Current developments in expanded mining and manufacturing activities may prove to be a potent factor in forcing improvements in agricultural techniques and reorienting the agricultural economy. Should these developments draw on the not-too-abundant agricultural labor supply, efficiency in agricultural production must be increased even to maintain present levels of output. In any case, the construction of transportation facilities associated with this proposed industrial and mineral expansion will stimulate agricultural development.

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